Rymer, Edwina

From: Stephen Chustz (DNR) < Stephen.Chustz@LA.GOV>

Sent: Monday, April 27, 2015 4:46 PM

To: 'Russel Honore';Mccarthy, Gina;Tejada, Matthew;Coleman, Sam;Anderson, Israel;Phillips,

Ginny;(b) (6)

Cc: marylee;Glo

Subject: RE: [GreenARMY] Railroad Commission to consider shutting down injection wells

Dear General Honore:

This agency is aware of the recent study that you cited and has been, and will continue, reviewing data and studies on all aspects of potential impacts of hydraulic fracturing and underground-injection disposal operations.

That study is among several that draw a potential connection between the high-rate underground-injection disposal of produced water associated with hydraulic fracturing found in Texas, Kansas, Oklahoma, Colorado, Arkansas, and Ohio with near contemporaneous seismic events. Additionally, the study mentioned in the below article correlates a secondary connection between some seismic events with the quick production of brine water along with the natural gas following hydraulic fracturing in an area near Azle, Texas.

After conferring with our staff, no incidents of similar seismic activity have been reported in Louisiana to date in either the vicinity of areas of widespread hydraulic fracturing operations or in areas around commercial injection disposal sites. This may be in part due to the fact that injection disposal in Louisiana generally occurs at lower pressures with corresponding lower injection rates than some other states. As was mentioned in the SMU-USGS report, when injection rates decreased in those areas experiencing seismic activity, the earthquakes seemed to either dramatically decrease or to completely stop.

Additionally, there are major differences in geology between Louisiana and the other states (Texas, Kansas, Oklahoma, Colorado, Arkansas and Ohio) mentioned in the cited report that may be the reason there have been no similar events in Louisiana reported to date. The geologic strata in Louisiana are mostly younger, less consolidated, and have been exposed to far less heating and stress and are less brittle and more flexible, and provide multiple sealing layers compared to the strata in the other states named. This has resulted in Louisiana being more geologically stable compared to those areas that are underlain by more consolidated strata that have been exposed to additional geologic forces where deep bedrock faulting may propagate uninterrupted to the surface. In Louisiana, multiple sealing layers and other sediments have buried deep, bedrock faulting and the massive plastic salt layer that often overlies the deep bedrock also provides an impediment to the propagation of any deep bedrock faulting.

However, this agency will continue to review the report that you referenced and makes no assumption that the lack of such reported events in Louisiana could be taken as proof that such events cannot happen here. To that end, agency staff continue to investigate the issue, evaluate potential regulatory actions, and determine if any additional steps should be taken to ensure that hydraulic fracturing and/or waste-injection disposal activities in this state do not lead to similar issues.

Thank you for making me aware of your concerns.

From: Russel Honore [mailto(b) (6) Sent: Sunday, April 26, 2015 8:21 AM To: Stephen Chustz (DNR); Ms McCarthy EPA; Tejada Matthew EPA; Sam Coleman; Israel Anderson; Ms Phillips; Dr

Subra

Cc: Marylee Orr; Glo

Subject: Fwd: [GreenARMY] Railroad Commission to consider shutting down injection wells

Mr Chustz have we studied this issue for Louisiana thanks

Best Regards,

LT General Russel Honore (Ret)



See/Smell Something, Say Something, Do Something, Take a picture Call 911

Begin forwarded message:

From: Glo (6)

Date: April 26, 2015 at 8:04:15 AM CDT

To: undisclosed-recipients:;

Subject: [GreenARMY] Railroad Commission to consider shutting down injection

wells

http://www.star-telegram.com/news/business/barnett-shale/article19437057.html#storylink=cpy

Railroad Commission to consider shutting down injection wells

By Max B. Baker- <u>maxbaker@star-telegram.com</u>

04/24/2015 8:18 PM

The Texas Railroad Commission said Friday it will consider shutting down two wastewater injection wells linked by a recent scientific report to a rash of earthquakes northwest of Fort Worth.

The commission will ask XTO Energy and EnerVest Operating at "show cause" hearings in June why their permits should not be canceled and their wells shut-in following a study by Southern Methodist University researchers this week stating they were the likely cause of the seismic activity.

"The Railroad Commission has in place strong rules addressing the issue of seismicity and disposal well activity, and it is incumbent upon us to apply these rules where and when appropriate for the protection of public safety and our natural environment," Chairman Christi Craddick said.

"In light of SMU's study linking disposal well activity to earthquakes in 2013, it is important to assess this new information in relation to the continued operational safety of the wells," she said.

State Rep. Drew Darby, chairman of the powerful House Natural Resources Committee, said he plans on holding hearings on the link between earthquakes and oil and natural gas drilling on May 4.

State Rep. Drew Darby, chairman of the powerful House Natural Resources Committee, said he plans on holding hearings on the link between earthquakes and oil and natural gas drilling on May 4. | Eric Gay / Associated Press archive

Concerned residents attended a public meeting in Azle last year to discuss recent area earthquakes and their possible link to drilling activity.

The SMU study said 27 earthquakes near Azle and Reno from November 2013 to January 2014 were in an area where no earthquakes had been reported or felt for 150 years, leading them to link the quakes to nearby wells.

Previously officials at the Texas Railroad Commission, which regulates the oil and gas industry, have been reluctant to link North Texas earthquakes, most recently near the old Texas Stadium in Irving, to drilling activity, saying they want to meet with the researchers and dig into the data.

Commissioner Ryan Sitton had already asked the study's authors to brief the commission at a public hearing, and on Friday state Rep. Drew Darby, chairman of the powerful House Natural Resources Committee, said he plans to hold hearings on the study on May 4.

Darby didn't go so far as to make the connection between drilling activity and earthquakes, but said the recent study warrants additional review. "Those studies indicate there is [a connection]. I'm not a scientist. I'm going to let the data drive the discussion," said the San Angelo Republican.

He also said he would support spending at least \$2.5 million to purchase mobile seismic monitors to investigate the link between drilling and earthquakes.

Last year, the Railroad Commission approved rules requiring drillers to provide additional information before sinking injection wells in areas where there has been seismic activity. Drillers seeking a permit are now required to provide information on the history of seismic events.

The rules also allow the commission to suspend or terminate a permit if seismic activity occurs near an injection well.

Ron Whitmire, a spokesman for EnerVest, said late Friday that the company looks forward to appearing before the commission. "We have serious questions about the assumptions made in the SMU study," particularly on how their computer modeling was conducted, he said.

Suann Lundsberg Guthrie, a spokeswoman for Fort Worth-based XTO, a subsidiary of Exxon Mobil, said they too look forward to meeting with the commission and the SMU researchers about "their findings and their methodology."

Even before the SMU study was released Tuesday, seismologists already suspected that hydraulic fracturing — which injects water, sand and chemicals deep into rock formations to free oil and gas — can cause small quakes that are rarely strong enough to register on monitoring equipment. Fracking also generates vast amounts of wastewater, which is then pumped into so-called injection wells, which sends the waste thousands of feet underground.

On Thursday, the U.S. Geological Survey released maps that show 17 areas in eight states with increased rates of man-made earthquakes, including southern Kansas and Oklahoma where earthquakes were rare before fracking sparked a U.S. drilling boom in recent years.

The SMU study, published in the scientific journal Nature Communications, was also written by researchers at the University of Texas at Austin and the U.S. Geological Survey. In their work they deployed 17 seismic stations in the Reno-Azle area. During the time period under review, there were 27 reported earthquakes, including two magnitude 3.6 events that were widely felt.

The seismology team identified two intersecting faults and used a sophisticated 3-D model to measure the changing fluid pressure within a rock formation. The researchers then used that model to estimate stress changes induced by the two wastewater injection wells and the more than 70 wells that remove natural gas and significant amounts of salty water, or brine.

Analysis of lake levels and groundwater variations caused by the recent drought also showed that there were no significant natural "stress changers" associated with the earthquake activity along the faults in the area before or during the seismic activity.

Darby was a panelist at an event at SMU Friday sponsored by the Texas Tribune to look into the future of energy in Texas over the next five years. The event turned into a discussion about the earthquake study and recent legislation in Austin regarding local control over drilling.

Darby said he plans to support a budget appropriation that would spend at least \$2.5 million to purchase mobile seismic monitors to investigate earthquakes in Texas near drilling activity.

Darby said the money would go to the TexNet Seismic Monitoring Program at the University of Texas at Austin. The set of seismometers, loaded on a vehicle, would be dispatched to an area where there has been a seismic event, he said.

"It is our intention to fund that \$2.5 million ... to get that mobile array out into the field," Darby said. "There's going to be discussions between now and the end of the session about whether or not that is enough. Do we need to double it?"

"My job is to make sure the public is protected and that we continue to have a regulatory authority that protects all interests in this state," he said.

The Railroad Commission does not have its own set of seismometers and has relied on data collected by researchers like those at SMU, said Ramona Nye, a spokeswoman for the agency.

Last year, reacting to concerns raised by North Texas residents about drilling and earthquakes, the agency hired its first seismologist, Craig Pearson, to help it understand the issue.

"The Railroad Commission takes the issue of induced seismicity very seriously," she said.

State Rep. Drew Darby, chairman of the powerful House Natural Resources Committee, said he plans on holding hearings on the link between earthquakes and oil and natural gas drilling on May 4.

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